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**SECRETARY, BOARD OF  
OIL, GAS & MINING**

Steven F. Alder (#00033)  
 Emily E. Lewis (#13281)  
 Assistants Utah Attorney General  
 1594 West North Temple St. #300  
 Salt Lake City, Utah 84118  
 Telephone (801) 538-5348

**BEFORE THE BOARD OF OIL, GAS & MINING  
 DEPARTMENT OF NATURAL RESOURCES  
 STATE OF UTAH**

IN THE MATTER OF THE REQUEST FOR  
 AGENCY ACTION OF LIVING RIVERS FOR  
 AN ORDER VACATING THE DIVISION'S  
 DECISION APPROVING THE PERMIT  
 APPLICATION OF RED LEAF RESOURCES,  
 INC., FOR THE SOUTHWEST #1 MINE,  
 LOCATED IN SECTIONS 19, 20, 29, AND 30,  
 TOWNSHIP 13 SOUTH, RANGE 23 EAST,  
 SLBM, AND SECTIONS 25 AND 36,  
 TOWNSHIP 13 SOUTH, RANGE 22 EAST,  
 SLBM, UINTAH COUNTY, UTAH.

**UTAH DIVISION OF  
 OIL, GAS, AND MINING'S  
 PRE-HEARING BRIEF**

Docket No. 2012 - 17

Cause No. M/043/0103

**INTRODUCTION**

The Division of Oil, Gas, and Mining ("Division") submits this Pre-Hearing Brief demonstrating how Division staff used their agency discretion and expertise to review and determine that Red Leaf Resources' ("Red Leaf") Notice of Intention ("NOI") to Commence Large Mining Operations for the Southwest #1 Mine M/047/0103 fulfilled the Utah Mined Land Reclamation Act, Utah Code Ann. § 40 Chapter 8, and the Large Mining Operation Rules, Utah Admin. Code R647-4 (collectively "mining rules").

The Utah legislature has determined mining to be in the public interest. To fulfill this goal in an informed and prudent manner, the Board of Oil, Gas, and Mining ("Board") and the Division established the mining rules. These rules require mining applicants to provide the Division information about their proposed projects. The rules

are purposefully written broadly to accommodate the array of mining techniques needed to extract Utah's multitude of hard rock resources. To balance the intentional lack of specificity, Division staff apply their professional expertise and discretion to determine what information is necessary to meet the requirements and intent of the mining rules. Only projects that satisfy the mining rules may be approved.

The role of the Division in this matter was simple: to determine whether Red Leaf's NOI contained correct, complete, and reliable information that met the requirements of the mining rules. Accordingly, the Board should rule the Division's determination that the NOI satisfied the mining rules was reasonable for three reasons: 1) the Division reasonably conducted its review of Red Leaf's NOI as defined by Utah's statutory and administrative regime; 2) written broadly, the Division reasonably used its agency discretion and expertise to determine the NOI satisfied the mining rules; and 3) the Division and its sister agencies maintain continuing oversight over the permit to ensure ground and surface waters are protected.

### **STANDARD OF REVIEW**

In its Response to Living Rivers Request for Agency Action, the Division originally requested the Board of Oil, Gas, and Mining ("Board") review this appeal under a *de novo* standard of review. *Response of the Utah Division of Oil, Gas, and Mining*, at 1 (hereinafter "Response"). In Utah, a *de novo* review means to try a case literally "anew, afresh, a second time." *Pledger v. Cox*, 626 P.2d 415 (Utah 1981) (speaking of judicial review of administrative actions in district court).

In its Response, Red Leaf argued the Board should apply "an arbitrary and capricious standard to determine whether there is a 'rational connection between the facts

found and the choices made by the Division.” *Red Leaf Resources, Inc. 's Response to Petitioner's Request for Agency Action*, at 2 (citing *Motor Vehicle Mfrs. Assn. v. State Farm Mutual Auto Ins. Co.*, 46 U.S. 29, 42 (1983)). Red Leaf identifies a “reasonableness” test to determine if an action is arbitrary and capricious. *Sierra Club v. Air Quality Board*, 2009 UT 76 ¶ 14; *Bourgeois v. Dept. of Commerce*, 41 P.3d 461, 463 (Ut. Ct. App. 2002)).

It is unclear from their Request for Agency Action what standard of review Living Rivers advocates.

Neither the mineral rules nor the Utah Administrative Procedures Act, Utah Code Ann. Title 63G Chapter 4, prescribe a standard of review for a formal review of an informal agency action. The appropriate standard is especially elusive in this matter because the Board is asked to conduct a deferential review of the agency decision and to allow for presentation of evidence similar to a *de novo* review. First, this matter is an appeal of the Division’s Informal Order upholding the Division’s conditional approval of Red Leaf’s NOI under Utah Admin. Code R647-5-106(17). *See, Cause No. M/047/1013, Findings of Fact, Conclusions of Law and Order for the Informal Conference*. Sitting in an appellate capacity, a deferential arbitrary and capricious standard and reasonable test, as advocated by Red Leaf, would be appropriate. However, the appeal provision also states that the appeal will “be in the form of a Request for Agency Action for a formal hearing before the Board . . . and in conformance with the Rules of Practice and Procedure before the Board.” Utah Admin. Code R R647-5-106(17). The Board’s Rules of Practice and Procedure also prescribe a formal *de novo*-like trail where the Board sits as fact finder and allows for intervention, limited discovery (i.e. the exchange of expert

reports), and testimony with direct and cross-examination. *See*, Utah Admin. Code Title R641 (2012).

To address this tension, the Division now recommends that the Board adopt the standard of review adopted by the Board's January 12, 2010 *Order* in Docket No. 2009-019; Cause No. C/025/0005 ("*Coal Hollow SOR Order*"). In the *Coal Hollow SOR Order* the Board determined, "the Board, while reviewing other issues *de novo*, will accord deference to the Division's findings and decisions where substantial technical analysis is involved." *Coal Hollow SOR Order*, at 5. The Coal Hollow matter was tried under the Utah Coal Act, which requires consistency with the federal Surface Mining Control and Reclamation Act. While recognizing they are different regulatory schemes, the mining rules contain no clear guidance on the applicable standard of review but present similar practical questions to the Coal Hollow case: what is scope of the record before the Board; what level of deference should the Division be afforded; and how best to address the Board's lack of technical expertise if they sit as a fact finder? Consequently, the rulings on the standard of review, deference, and scope recognized by the Board in the *Coal Hollow SOR Order* are applicable and should be adopted for this case.

These Board should adopt the *Coal Hollow SOR Order* rulings as follows: 1) the Board does not limit its review to the record developed in the Division's informal process, but will conduct a formal adjudicative proceeding in which parties have opportunity to present evidence, *Coal Hollow SOR Order*, at 2; 2) Petitioners bear the burden of proving the Division erred in its decision with respect the subject permit, *Coal Hollow SOR Order*, at 3; and 3) the Board does not defer to the Division's conclusion of law but to the extent the Division's decision was based on substantial technical analysis, the Board will not set it aside absent a showing of error, "i.e., a showing that it is contrary



to the evidence or otherwise arbitrary or capricious.” *Coal Hollow SOR Order*, at 4 (citing *Save Our Cumberland Mountains, Inc. v. Office of Surface Mining Reclamation and Enforcement*, No. NX-97-3-PR (U.S.D.O.I. –O.H.A., July 30, 1998), at 19-22). See also, *Sierra Club*, 2009 UT 76 ¶ 14; *Bourgeois*, 41 P.3d 461, 463 (adopting a reasonableness test for an arbitrary and capricious review).

#### STATEMENT OF FACTS

Red Leaf is a privately held company engaged in the development of its in-situ EcoShale™ In-Capsule Technology to process and remove kerogen from the naturally occurring oil shale deposits in the Mahogany formation of the geologic Douglas Creek Member. Red Leaf holds School Institutional Trust Lands Administration Mineral Leases 50150 and 43374 on the Tavaputs Plateau.

Prior to submitting its Large Mining Operation NOI, Red Leaf held a five-acre exploratory permit that was later converted to a five-acre Small Mining Operation S/047/0102. At the small mine facility, Red Leaf constructed a pilot capsule approximately one-acre in size.

On April 28, 2011 Red Leaf submitted their Large Mine Operation NOI to the Division to expand its small mine. The proposed mine will replicate the technology used in the pilot capsule on a commercial scale. This commercial-scale mine will consist of 118 capsules, each measuring 900 feet long, 500 feet wide, and will eventually settle to a height of around 136 feet tall. The total acreage to be disturbed is estimated to be 1477 acres.

Upon review of the initial application, the Division determined the NOI was incomplete and requested further information from Red Leaf. Between early September

and mid-October 2011 Red Leaf provided, and the Division accepted, the requested information.

During this time the Division also communicated with Red Leaf regarding Red Leaf's interaction with the Utah Department of Water Quality ("DWQ") and the necessity for Red Leaf to submit a ground water discharge permit application to DWQ. On October 6, 2011, Rob Herbert of DWQ sent a letter to Bob Bayer of JBR Environmental Consultants stating that DWQ had determined Red Leaf would need to submit a complete ground water discharge permit application ("GWPA") for the Southwest #1 Mine. Reflecting DWQ's request for a GWPA, the language on page thirty-three of the original NOI, now renumbered page forty-two, was adjusted to reflect communications with DWQ.

On October 20, 2011 the Division published public notice of the Division's Tentative Approval of Red Leaf's NOI. That same day the Division sent a letter to James Patten of Red Leaf notifying Red Leaf of the Division's Conditional Tentative Approval requiring Red Leaf to comply with Condition 1: "Thirty days (30) prior to ground disturbance, please include in the plan either a groundwater discharge permit (including a permit by rule) from the Utah Division of Water Quality, or a letter saying a permit is not required."

On November 18, 2011, Living Rivers timely submitted a Protest to the published Tentative Approval. Living Rivers' Protest identified four areas of concern: 1) the NOI failed to adequately account for the possible existence of susceptible groundwater resources in the area of the mine; 2) the NOI failed to account for the possible impacts to ground water in the area of the mine; 3) there is no evidence that Red Leaf intends to obtain, or that DOGM intends to require, a groundwater permit from the Division of

Water Quality ("DWQ"), as required by DWQ regulations; and 4) the NOI fails to provide adequate information to show that the design of the EnShale (sic) capsules will be sufficient to prevent leakage of petrochemicals into the area surrounding the mine, and specifically into local perched groundwater aquifers.

On December 21, 2011, JBR Environmental Consultants, on behalf of Red Leaf, submitted to the Division the entirety of its GWPA submitted to DWQ. The Division added the GWPA as Appendix S to the NOI on January 11, 2012. On February 10, 2012 Rob Herbert, P.G. Manager for Utah Division of Water Quality Ground Water Protection Section, requested additional information from Red Leaf to complete DWQ's review of Red Leaf's GWPA.

The Division determined Living Rivers' November 18, 2011 comments constituted "written objections of substance" and on February 23, 2012 at 9:00 a.m. commenced a formal proceeding hearing before the Division. At the start of the proceeding, deeming it appropriate, in the public interest, and not unfairly prejudicial to the rights of any party, Hearing Officer John Baza converted the formal proceeding to an Informal Conference.

After reviewing the testimony, information submitted at or in response to the Informal Conference, and the information in the file to date, on March 9, 2012 Hearing Officer Baza issued his Findings of Fact, Conclusions of Law, and Order for the Informal Conference. The Informal Order held that:

- 1) The Tentative Conditional Approval approved on October 20, 2011 is now final.
- 2) Red Leaf Resources must still comply with Condition 1: "Thirty days (30) prior to ground disturbance, please include in the plan either a groundwater discharge

permit (including a permit by rule) from the Utah Division of Water Quality (DWQ), or a letter saying a permit is not required.”

- 3) DOGM reserves all enforcement and inspection rights under R647-6 et seq. to monitor the Southwest Mine #1 to ensure ground and surface waters are adequately protected if Red Leaf complies with Condition 1.

Pursuant to rights granted under Utah Admin. Code R647-5-106(17), as an aggrieved party to the Informal Conference before the Division, on March 19, 2012 Living Rivers brought this Request for Agency Action. Living Rivers asks the Board to vacate the Division’s approval of Red Leaf’s permit application and enter an order denying approval of the permit application as inaccurate, incomplete, or both, or in the alternative vacate the approval decision and remand the matter to the Division to allow Red Leaf to correct the identified permit deficiencies.

### **ARGUMENT**

The purpose of this Pre-Hearing Brief is to demonstrate for the Board the structure of a NOI review and the how the Division reasonably used its agency discretion and expertise to determined Red Leaf’s NOI satisfied the mining rules. The purpose of this Pre-Hearing Brief is not to engage in a debate over the veracity of the conflicting expert information provided by Red Leaf and Living Rivers’ experts. The Board should grant deference to the Division’s technical determination that Red Leaf’s NOI met the requirements of the mining rules because the action was reasonable for three reasons: 1) the Division reasonably conducted its review of Red Leaf’s NOI as defined by Utah’s administrative regime and statute; 2) written broadly, the Division reasonably used its agency discretion and expertise to determine the NOI satisfied the mining rules; and 3)



the Division and its sister agencies maintain continuing oversight over the permit to ensure ground and surface waters are protected.

- I) THE BOARD SHOULD FIND THAT THE DIVISION REASONABLY CONDUCTED ITS REVIEW OF RED LEAF'S NOI, AS DEFINED BY STATUTE AND THE DIVISION'S ROLE IN UTAH'S ADMINISTRATIVE REGIME.

The scope of the Division's review of Red Leaf NOI's establishes the sideboards of what Division actions are expected for a reasonable review of the permit. A reasonable review is informed by: i) the Division's defined role within Utah's administrative regime; ii) the Division's agency discretion and expertise; and iii) the structure and intent of an NOI .

- i) As one component of Utah's larger regulatory regime, the Division is limited to its duties to regulate mining in the State of Utah.

The first factor defining the scope of the Division's review of an NOI is the Division's role within Utah's regulatory regime. To efficiently and effectively manage state government, the Utah legislature has created administrative agencies with specific duties and roles. As the regulator for their field of expertise, a single matter, like a proposed mining project, may involve several agencies. To avoid duplicate work specific statutes and rules define the division of labor amongst agencies. While agencies may work in conjunction with each other, their authority does not extend to matters not specifically delegated to it. *See* Utah Cod Ann. § 40-8-17; R647-1-102(3)(2012) (requiring NOI applicants to comply with all other relevant statutes).

In the present case, Red Leaf's proposed Southwest #1 Mine requires the oversight of several agencies: namely the Division and DWQ. The mining rules

recognize that the Division does not work alone nor is intended to occupy the entirety of the regulatory field for a project: instead the Division is it intended to cooperate with its sister agencies and refer to their expertise by reserving those agencies relevant work. *See*, Utah Admin. Code R647-1-102(2) (the objective of cooperative agreements is to minimize the need for operators to undertake duplicative, overlapping, excessive, or conflicting procedures). For example, DWQ is responsible for reviewing matters of water quality and particularly the issuance of a ground water discharge permits. *See*, Utah Code Ann. Title 9 Chapter 5; Utah Admin. Code Title R317. The Division is responsible for implementing the mining rules. While hydrology is a component of the mineral rules, discussed below, it is mentioned in reference to mining practices. The mineral rules contemplate that water quality concerns will be will be addressed by DWQ, the designated expert in the field.

Consequently, the Division's review of a NOI is limited to assessing content for how it meets the relevant mining rules and reserves review of other aspects of the application for its expert sister agency. *Baker Aff.* at ¶ 9.

- ii) Division staff apply their agency discretion and professional expertise to review and determine if the information provided in a NOI meets the requirements of the NOI.

The second factor defining the scope of the Division's review of an NOI is the reasonable use of agency discretion and expertise. As stated above and discussed in depth below, the mining rules are written broadly. "When the operative terms of a statute are broad and generalized, these terms bespeak a legislative intent to delegate their interpretation to the responsible agency." *LPI Services v. McGee*, 215 P.3d 135 (Utah 2009). Accordingly, an administrative agency like the Division "should be allowed a comparatively wide latitude of discretion in performing its responsibilities." *Petty v. Utah*

*State Bd. of Regents*, 595 P.2d 1299 (Utah 1979). However, “discretion” . . . does not mean absolute or arbitrary power but it must be exercised in a reasonable manner and not maliciously, wantonly, and arbitrarily to the injury of another.” *Murphy v. Grand County*, 268 P.2d 677 (Utah 1954). Accordingly, being broadly written, the Division has a wide latitude of discretion to reasonably perform its responsibility and determine whether an NOI satisfies the mining rules.

The Division reasonably exercises its discretion by applying its agency expertise. Agency expertise generally consists of the three components: agency experience; agency technical knowledge; and agency perspective. *See*, STENVNL § 15:48, *Decisions Based upon Agency Expertise* (2011).

First, the Division exercises agency expertise by having over 35 years of experience permitting and regulating thousands of mining operations under the mining rules. *See*, Laws 1975, c. 130 s 16 (initial passage of Utah Mined Land Act). Baker Aff., at ¶ 12. Accordingly, it has developed procedures to effectively and efficiently perform its responsibilities. Baker Aff., at ¶13. For example, the Division has established NOI templates to homogenize the form of submitted information, divides review of the NOI between individual staff with specialty expertise, and designates a permit lead to oversee the review. Baker Aff., at ¶13. In addition to honing its internal practices, through decades of experience, the Division has also amassed an extensive knowledge base about mining in the State of Utah that it can apply to individual situations. Baker Aff. at ¶14.

Second, the Division exercises agency expertise by utilizing the technical knowledge of individual Division employees with the requisite education and technical training who have experience applying that education and training to specific factual situations. For example, Division staff have relevant subject matter degrees like Tom

Munson's degree in Watershed Management and Leslie's Heppler's Geology degree, the two Division staff primarily responsible for reviewing the NOI. Baker Aff., at ¶15. Most staff have also had extensive practical work experience in the private sector, such as Ms. Heppler's work for private sector mines for almost 17 years. Baker Aff., at ¶17. Additionally, many staff, like Mr. Munson and Mr. Heppler, have many years, if not decades, of experience working for the Division reviewing NOIs and implementing the mining rules. Baker Aff., at ¶16.

The Division's intentional employment of staff with varied technical knowledge ensures staff are familiar with the relevant technical information, industry standards, and general mining practices. Accordingly, the role of Division staff, like Ms. Heppler and Mr. Munson, is not to sit as a reviewing "expert" on every facet of a NOI but to be uniquely situated to assess the efficacy of the information provided and whether an NOI satisfies the mining rules. Baker Aff., at ¶18.

Third, the Division reasonably exercises its agency expertise by accounting for the Division's unique perspective. As an administrative agency, the Division must undertake the complex process of balancing a variety of legal, technical and policy factors affecting an individual permit. For example, the Division must consider the scope of its review, the role of other state entities, the novelty of the project, intent of the mining rules, precedential affect of the permitting decision, etc.. Baker Aff., at ¶19. For example, the Red Leaf NOI was not submitted as a scaled project. However, the practical reality is that, while the permit is for the entirety of the final project, the NOI contemplates a scaled build out over time where the operator and Division can learn from each stage and adjust the permit accordingly. NOI, at Figure 3. Utah Admin. Code R647-4-102 (2012) (Division ability to adjust permit when warranted).



In conclusion, the Division reasonably exercises its discretion to implement the mining rules by applying its agency expertise consisting of agency experience, agency technical knowledge, and unique agency perspective.

- iii) By threat of civil action and penalties, the purpose and intent of NOI is for operators to submit accurate, complete, and reliable information for the Division to review.

The third factor defining the scope of the Division's review of an NOI is structure and intent of NOI. The statutory mechanism for an individual to avail themselves of mining in the State of Utah is through the submission of a Notice of Intention. Utah Code Ann. § 40-8-13. The statutory requirements of an NOI are very brief and only require the submission of mineral interests, copies of underground and surface mine maps, locations of drill holes, accurate maps of existing and proposed operations, information regarding material to be extracted or moved, and various reclamation assurances. Utah Code Ann. § 40-8-13 (b)-(d)(2012). As will be discussed below, the mining rules found at Utah Admin. Code R647-4 expand upon the statute by requiring additional information.

When the Division's receives an NOI it operates under the assumption that the information provided is accurate and true. Baker Aff., at ¶22. The statute supports this assumption by requiring "any person who knowingly makes a false statement, representation, or certification, or knowingly fails to make a statement, representation, or certification in an application . . . shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than one year, or both." Utah Code Ann. § 40-8-9.1 (7)(2012). *See also*, Utah Code Ann. R647-8-101 et seq.(2012) (specifying when an individual civil penalty may be assessed).



To demonstrate the veracity and caliber of their information, many applicants use professional services with verifiable credentials such as professional geologists or engineers, established industry methods such as factors of safety, and previously vetted information such as published geologic maps or USGS quadrangles. Baker Aff., at ¶ 23.

The Division then uses its professional expertise to determine if the NOI meets the mining rules, discussed below. When reviewing an NOI the Division is under an obligation to follow the rules as written, assume the validity of the rules, and review all applications with the same scrutiny and care. Baker Aff. at ¶ 24. *State, By and Through Dept. of Community Affairs v. Utah Merit System Council*, 614 P.2d 1259 (Utah 1980) (holding that administrative regulations are presumed to be reasonable and valid and cannot be ignored or followed by agency to suit its own purposes, and agency must be held to those regulations without compelling ground for not following them).

To start their review, Division staff verify the information provided in the NOI for completeness. Utah Code Ann. § 40-8-13 (4)(a); Baker Aff., at ¶ 25. Such review entails ensuring that tables are complete, modeling parameters are reasonable, maps coordinate with publically available tools like GoogleEarth, and other measures to test the efficacy and integrity of the information provided. Baker Aff., at ¶ 26. If more is necessary to interpret that information, Division staff “shall make further inquiries, inspections, or examinations that necessary to properly evaluate the notice.” Utah Code Ann. § 40-8-13 (4)(a). These “inquiries, inspections, or examinations” generally consists of the Division asking the applicant provide additional information that directly relates to what is provided in the NOI. Utah Code Ann. § 40-8-13 (4)(a). Baker Aff., at ¶ 27. They are not an independent call for the for the Division to “re-do” the work of the applicant’s professional consultants or require the universe of alternative or new analysis.

In summary, the scope of the Divisions review of Red Leaf's NOI was reasonable because it is defined by the Division's role and duties within Utah's administrative regime, the execution of Division's agency discretion and expertise, and the structure and intent of an NOI .

- II) THE BOARD SHOULD HOLD THAT THE DIVISION REASONABLY FOUND RED LEAF'S NOI SATISFIED THE LARGE MINING RULES BECAUSE THE RULES ARE BROADLY WRITTEN AND THE AGENCY REASONABLY USED ITS DISCRETION AND EXPERTISE TO REVIEW AND APPROVE THE NOI.

The Division reasonably determined Red Leaf's NOI met the requirements of the large mining rules. The review was reasonable because: i) the mining rules are generally written to apply to, protect the resource, and reclaim the disturbance for a variety of mining operations; ii) Red Leaf provided information that met the mining rules; and 3) the Division conditioned the approval on Red Leaf obtaining a ground water discharge permit from DWQ.

- i) To apply to the variety of mining techniques and mineral resources, the mining rules are intentionally general leaving determinations of adequacy to Division discretion and expertise.

The large mining rules are written in broad terms to accommodate a multitude of mining activities. For example, the mining rules apply equally to the Kennecott Copper mine as well as small gypsum or other hard rock quarries. Baker Aff., at ¶ 8. To accommodate this breadth, the mining rules do not specify the quantity or type of information necessary to satisfy their requirements. Baker Aff., at ¶9 . By comparison, specific to a known resource, the Utah Coal Act has an entire administrative rule with 55 subparts, each containing numerous sub-sub parts, to account for hydrology issues at a coal mining operation. *See* Utah Admin Code. R645-301-700, Hydrology. In contrast, as will be discussed, hydrology under the mining rules is only mentioned several times.

- ii) Division staff had the discretion to and reasonably determined that Red Leaf's NOI met the mining rules requirements.

Living Rivers essentially challenges the Division's determination that the NOI met the mining rules requirements for a depth to groundwater analysis and ground water impact statement.<sup>1</sup>

This section will briefly summarize the information provided by the October 20, 2011 tentative conditional approval which the Division found to satisfy the mining rules. A summary is sufficient for several reasons. To start, the purpose of this brief is to establish the structure of a NOI review and deference to agency discretion and expertise, not to engage in an expert debate about the veracity of technical information. Additionally, the Division's Response to Living River's Request for Agency has already directed the Board to the specific places in the NOI and testimony from the Informal conference the Division believes demonstrates how Red Leaf's NOI met the mining rules. Furthermore, the other parties will extensively discuss the veracity of technical information in their briefs and at oral argument. Consequently, this section will only briefly summarize what information meets the rules.

- a) *Red Leaf Resources provided sufficient information to meet the mining rules requirement for a Depth to Ground Water Analysis.*

Utah Admin. Code R647-4-106(8) states "the operator shall provide a narrative description referencing maps or drawings as necessary, of the proposed operations including, . . . depth to groundwater, extent of overburden material and geologic setting." Utah Admin. Code R647-4-106(8)(2012).

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<sup>1</sup> Living River's fourth argument also attacks the Division's review of the integrity of the capsule design but points to no statute or rule the Division's review has violated. Please see the Division's Response to Argument D. Response at 12-15.

The Division found the NOI satisfied R647-4-106(8). Specifically, page 37-38 of the NOI, entitled *106.8: Depth to Groundwater, Extent of Overburden Material and Geologic Setting*, includes a narrative description of the ground water in the area. The description identifies groundwater associated with the Mesa Verde Group as the uppermost aquifer of regional extent in the permit area. As indicated by the Division's own oil and gas files, the top of the Mesa Verde Formation is between 3000 - 4000 feet below ground surface. The NOI also states that surface data from Price and Miller (1975) indicated the Parachute Creek and Douglas Creek members, formations within the project area that lie above the Mesa Verde Group, are key aquifers in the area. Red Leaf's narrative addressed this information in three ways: 1) demonstrating there are no USGS mapped springs issuing from either of these members in or near the parcels; 2) exploration drilling by Red Leaf did not encounter ground water; and 3) records of nearby water wells from the Utah Division of Water Rights indicate varying low amounts of ground water present.

At the Informal Conference on the matter, Division staff testified that, in their professional judgment, the quantity and form of Red Leaf's information satisfied Utah Admin. Code R647-4-106(8). Transcript at 50-51. *See also*, Division Response, at 9-10.

- b) The Division reasonably used its agency discretion and expertise to determine that the NOI met the mining rules requirement to describe Potential Impacts to Surface and Groundwater systems.*

Utah Admin. Code R647-4-109.1 states "the operator shall provide a general narrative description identifying potential surface and/or subsurface impacts. This



description will include, at a minimum . . . projected impacts to surface and groundwater systems.”

Page 40-42 of the NOI, is entitled, VI. R647-4-109 Impact Statement, 109.1 Projected Impacts to Surface and Groundwater Systems. The NOI states surface waters are generally not present being ephemeral/intermittent and that rainfall is generally low. Similarly, Page 41 of the NOI describes how Red Leaf intends to use best management and reclamation practices to mitigate any impacts to surface water if present. These practices include, among others: installing prior to earth disturbing activities, water diversions, sumps, and ponds designed to account for a 100-year, 24 hour storm event and perimeter ponds and ditches for runoff control. The NOI also includes Appendix E, a Drainage Control Plan. At the Informal Hearing Mr. Munson testified he felt the NOI met the requirements of R647-4-109.1. Transcript, at 29.

In terms of ground water, page 42 of the NOI states that ground water is not susceptible to any impacts from the mining and retorting operations because it is isolated from those operations by several hundred feet of low permeability marlstones. NOI at 42. Ms. Heppler testified she reviewed the NOI and concurred with the conclusion that there was extremely limited potential for groundwater impacts. Transcript at 53.

In conclusion, the Division used its expertise to determine that on October 20, 2011 the information in Red Leaf's NOI satisfied the mining rules. Consequently, having already found the information adequate, contrary to Living River's claims, the additional information provided in the DWQ GWPA merely bolsters and does not change the Division's decision or use of discretion

- iii) The Division further ensured the project would protect surface and ground waters by conditioning approval on the permit of Red Leaf obtaining a ground water discharge permit.



Living Rivers raises the concern that the Division's review is inadequate because information in Red Leaf's GWPA application indicates there may be leakage from the capsules through the Bentonite Amended Soil (BAS) layer that might affect ground and surface waters.

As discussed, the Division is but one component of Utah's administrative regime and is intended to avail itself of the expertise of its sister agencies. The mining rules recognize this statutory scheme by requiring operators to comply with all other applicable rules and regulations of other agencies with jurisdiction over a project, including those of DWQ. Utah Code Ann. § 40-8-17; R647-1-102(3)(2012). *See also, Utah Dept. of Transp. V. ROA General, Inc.*, 927 P.2d 666 (Utah App. 1996) (administrative agency of state has inherent authority to identify existing requirement of law and make it condition to granting of permit or license).

Under the Utah Water Quality Act, DWQ cannot allow Red Leaf to undertake a project that results in a "discharge of a pollutant into waters of the state or to cause pollution which constitutes a menace to public health and welfare, or is harmful to wildlife, fish or aquatic life, or impairs domestic, agricultural, industrial, recreational, or other beneficial uses of water . . . ." Utah Code Ann. § 19-5-107(1)(2012)). If the project is found to have such a discharge, Red Leaf will not be issued a permit and the project cannot go forward. Consequently, though already statutorily obligated to comply, the Division ensured ground and surface waters were further protected by explicitly conditioning permit approval of the NOI on receipt of a ground water discharge permit.

In conclusion, considering the broad nature of the mining rules and the large degree of agency discretion to use its expertise to determine the adequacy of information,

the Board should determine that the Division thoroughly reviewed Red Leaf's NOI and reasonably determined it met the requirements and intent of the mining rules.

Additionally, the Board should feel comfortable with the Division's decision because it further ensured protections of surface and ground water by conditioning the permit on the receipt of a groundwater discharge permit.

III) SURFACE AND GROUND WATERS ARE ADDITIONALLY PROTECTED BY THE DIVISION AND ITS SISTER AGENCIES CONTINUING JURISDICTION AND OVERSIGHT OF THE PROJECT.

In addition to having satisfied the broad nature of the mining rules, the Division and its sister agencies, like DWQ, exercise continuing jurisdiction and oversight of the project on several counts that will ensure ground and surface waters are protected.

First, under the mining rules the Division is required to inspect all permitted operations to ensure continued compliance with its permit and the mining rules. Utah Admin. Code R647-6-101(2) (2012). If the Division finds "any violation . . . which creates an imminent danger to the health or safety of the public; is causing or can reasonably be expected to cause significant, imminent environmental harm to land, air, or water resources" the Division can immediately order a cessation of operations. Utah Admin. Code R647-6-102(1)(2012). The Division is also authorized to take proactive measures if they find a violation that is not an imminent danger by issuing Notices of Violation to correct the condition. Utah Admin. Code R647-6-102(2)(2012). These enforcement provisions are reinforced with civil penalties, both for the operation and the operator as an individual. Utah Admin. Code R647-7-101 et seq. (2012); R647-8-101 et seq. (2012).

In addition to the Division's enforcement powers, the Division "may review the permit and require updated information and modifications when warranted." Utah Admin. Code R647-4-102 (2012). For example, if after Red Leaf builds its first capsule it becomes apparent additional measures are needed to protect ground and surface waters, the Division can review the permit and require the necessary modifications.

Like the Division, DWQ has continuing oversight of the project. For example, if Red Leaf receives and groundwater discharge permit, by statute the term of the permit cannot exceed five year. Utah Code Ann. § 19-5-108(2) (2012). Upon its expiration a new permit can only be issued after an opportunity for public hearing and a finding that the applicant has met the applicable water quality requirements. *Id.*

These additional statutory enforcement and review measures further ensure the surface and ground waters within the project area are protected.

#### **PRAYER FOR RELIEF**

The Division asks that the Board the uphold the Division's decision to conditionally approve Red Leaf's NOI to commence oil shale and processing on the Tavaputs Plateau. The mining rules are broadly written to accommodate many forms of mining, consequently the Board should defer to the Division's discretion and expertise gained from 35 plus years of agency experience, agency technical knowledge, and agency perspective to determine if Red Leaf's technical information meets the mining rules. if the Board finds additional monitoring or inspection conditions to the current permit approval are prudent to protect ground and surface waters at the site, the Division asks the Board so order it.

In the alternative, if the Board finds information from the DWQ's GWPA may necessary prior to a final approval of the NOI, the Division asks the Board's decision of the permit be stayed until the decision by DWQ is concluded and any additional findings associated with that decision reviewed for compliance with the mining rules.

Respectfully submitted this 11th day of June 2012.

A handwritten signature in dark ink, appearing to read "Steven F. Alder", is written over a horizontal line.

Steven F. Alder (#0033)

Emily E. Lewis (#13281)

Assistant Attorneys General

Counsel for the Division of Oil, Gas, and Mining

### CERTIFICATE OF MAILING

I hereby certify that I caused a true and correct copy of the forgoing **UTAH DIVISION OF OIL, GAS, AND MINING'S PRE-HEARING BRIEF** for Case No. M/043/0103, Docket No. 2012-17 to be mailed with postage prepaid to the address shown and emailed, the 12<sup>th</sup> day of June, 2012, to:

Denise Dragoo  
Snell & Wilmer, LLP  
Salt Lake City, Utah 84101  
[ddragoo@swlaw.com](mailto:ddragoo@swlaw.com)

Joro Walker  
Rob Dubuc  
Western Resource Advocates  
150 South 600 East  
Salt Lake City, Utah 84102  
[jwalker@westernresources.org](mailto:jwalker@westernresources.org)  
[rdubuc@westernresources.org](mailto:rdubuc@westernresources.org)

*Julie Ann Carter*



Steven F. Alder (#00033)  
Emily E. Lewis (#13281)  
Assistants Utah Attorney General  
1594 West North Temple St. #300  
Salt Lake City, Utah 84118  
Telephone (801) 538-5348

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**BEFORE THE BOARD OF OIL, GAS & MINING  
DEPARTMENT OF NATURAL RESOURCES  
STATE OF UTAH**

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IN THE MATTER OF THE REQUEST FOR AGENCY  
ACTION OF LIVING RIVERS FOR AN ORDER  
VACATING THE DIVISION'S DECISION  
APPROVING THE PERMIT APPLICATION OF RED  
LEAF RESOURCES, INC., FOR THE SOUTHWEST  
#1 MINE, LOCATED IN SECTIONS 19, 20, 29,  
AND 30, TOWNSHIP 13 SOUTH, RANGE 23  
EAST, SLBM, AND SECTIONS 25 AND 36,  
TOWNSHIP 13 SOUTH, RANGE 22 EAST, SLBM,  
UINTAH COUNTY, UTAH.

**AFFIDAVIT OF PAUL BAKER**

Docket No. 2012 - 17

Cause No. M/043/0103

**STATE OF UTAH                    )**

**ss:**

**COUNTY OF SALT LAKE    )**

I, Paul Baker, being first sworn upon oath do hereby affirm that the information set forth hereafter is true and correct of my own information and belief.

1. I am over twenty-one years of age and otherwise competent to provide testimony in this matter and do so of my own free will and choice.

2. I am currently employed by the Utah Division of Oil, Gas and Mining as the Manger of the Minerals Program for the Division. I have held this position for almost four years.

3. I have worked for the Division since 1991. Prior to being the minerals program manager, I was employed as reclamation biologist from 1991 to 2008.

4. Prior to my employment at the Division I worked as a Seed Analyst for the Utah Department of Agriculture from 1988 to 1991, and I worked as a Seed Technician for the Utah Department of Agriculture from 1986 to 1988. Before this, I worked the summers of 1981 and 1982 as a Biological Aide for the Utah Division of Wildlife Resources.

5. I have Bachelor of Science degree in Botany from Weber State College which was awarded in 1982. I also have a Masters Degree in Range Ecology from Utah State University awarded in 1988.

6. My responsibilities as Minerals Program Manager include supervision of seven employees who are the persons responsible for administering the Utah Mined Land Reclamation Act and Minerals Program's Rules (collectively the "minerals program"). I am personally acquainted with the work and tasks these individuals perform as they administer the mineral regulatory program including: the review of Notices of Intention to conduct all types and sizes of mining operations, inspections of mining operations for compliance with the minerals program, estimating bonding amounts, approving bonding instruments, rule-making, and taking enforcement actions for violations of the mineral program.

7. I am personally knowledgeable of the contents and process for review for the Red Leaf Resources' ("Red Leaf") Notice of Intention ("NOI") to commence mining at the Southwest #1 Mine.

8. The minerals program consists of statute and rules that are written with a minimal amount of specificity in order to accommodate the wide array of mining techniques, broad spectrum of minerals, and mine sizes that are involved in extracting Utah's multitude of hard rock resources. For example, the mining rules apply equally apply to the Kennecott Copper mine as well as small gypsum or other hard rock quarries.

9. To balance the intentional lack of specificity in the mineral rules, the Division staff use their professional expertise and discretion to determine what information is necessary to meet requirements and intent of the mining rules.

10. The Division was required to determine whether Red Leaf's NOI contained correct, complete, and reliable information that met the requirements of the mining rules.

11. Red Leaf's proposed Southwest #1 Mine requires the oversight of several agencies: namely the Division and Utah Division of Water Quality. DWQ is responsible for reviewing matters of water quality and particularly the issuance of a ground water discharge permits. The Division is responsible for implementing the mining rules.

12. The Division has over 35 years of experience permitting and regulating over a thousand mining operations under the mining rules.

13. The minerals program has developed procedures to effectively and efficiently perform its responsibilities. For example, the Division has established NOI templates to homogenize the form of submitted information, divide review of the NOI between individual staff with specialty expertise, and designate a permit lead to oversee the review.

14. In addition to honing its internal practices, with decades of experience the Division has also amassed an extensive knowledge base about mining in the State of Utah it can apply to individual situations.

15. The Division exercises agency expertise by utilizing the technical knowledge of individual Division employees who have the requisite education and technical training and apply that experience, education, and training to specific factual situations.

16. Many staff, like Mr. Munson and Ms. Heppler, have many years, if not decades, of experience working for the Division reviewing NOIs and implementing the mining rules.

17. The Division intentionally seeks staff with varied technical knowledge to ensure staff are familiar with the relevant technical information, industry standards, and general mining practices.

18. The role of Division staff is not to sit as a reviewing "expert" on every facet of an NOI but to be uniquely situated to assess the efficacy of the information provided and whether an NOI satisfies the mining rules.

19. The Division also sits in a unique perspective where it must undertake the complex process of balancing a variety of legal, technical and policy factors affecting an individual permit. For example, the Division must consider the scope of its review, the role of other state entities, the novelty of the project, intent of the mining rules, precedential affect of the permitting decision, etc.

20. The statutory mechanism for an individual to avail themselves of mining in the State of Utah is through the submission of a Notice of Intention.

21. The statutory and regulatory requirements for an NOI are very brief and require the Division to use their expertise to determine whether or not the information submitted meets the mining rules.

22. When the Division receives an NOI it operates under the assumption that the information provided is accurate and true.

23. To demonstrate the veracity and caliber of their information, many applicants use professional services with verifiable credentials such as professional geologists or engineers, established industry methods, such as factors of safety, and previously vetted information such published geologic maps or USGS quadrangles.

24. When reviewing an NOI the Division follows the mining rules as written, assumes the validity of the rules, and reviews all applications the same scrutiny and care.

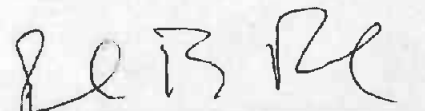
25. To start their review of an NOI, Division staff verify the information provided in the NOI for completeness.

26. Such review entails ensuring tables are complete, modeling parameters are reasonable, maps coordinate with publically available tools like GoogleEarth, and other measures to test the efficacy and integrity of the information provided.

27. If more information is necessary to interpret that provided in the NOI, Division staff make further inquiries, inspections, or examinations that are necessary to properly evaluate the NOI. These "inquiries, inspections, or examinations" generally consists of the Division asking the applicant provide additional information that directly relates to what is provided in the NOI.

28. These inquiries are not an independent call for the Division to "re-do" the work of the applicant's professional consultants or require the universe of alternative or new analysis.

DATED this 11<sup>th</sup> day of June, 2012.

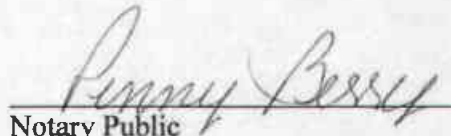


Paul Baker  
Minerals Program Manager

SUBSCRIBED AND SWORN to this 11 day of June, 2012.

My Commission Expires

1/4/2015



Notary Public

Resides at:

Salt Lake





## Paul B. Baker

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### Contact Information

Address: 9922 East 200 South, Huntsville, Utah 84317  
Telephone: Home 801-745-6017  
Cell 801-791-0618  
Work: 801-538-5261  
E Mail: paulbrbaker@gmail.com  
United States Citizen

### Experience

2008-present; Utah Division of Oil, Gas and Mining; 1594 W. North Temple, Salt Lake City, Utah 84114. Supervisor: Dana Dean, 801-538-5320.

#### **Minerals Program Manager**

Supervise the minerals regulatory program which is authorized under the Utah Mined Land Reclamation Act. The primary emphasis of the program is mine reclamation although other aspects of environmental compliance are also regulated.

2001-2008; Utah Division of Oil, Gas and Mining; 1594 W. North Temple, Salt Lake City, Utah 84114. Supervisor: Susan White, 801-538-5258.

#### **Environmental Scientist III, Reclamation Biologist**

Reviewed mine plans, inspected mines, etc., under the Utah Mined Land Reclamation Act.

1991-2001; Utah Division of Oil, Gas and Mining; 1594 W. North Temple, Salt Lake City, Utah 84114. Supervisor: Daron Haddock, 801-538-5325.

#### **Reclamation Biologist**

Reviewed coal mining and reclamation plans for conformity with the Surface Mining Control and Reclamation Act (SMCRA) and other laws, such as the Migratory Bird Treaty Act, the Endangered Species Act, the Bald Eagle Protection Act, and the Clean Water Act. Made written findings whether plans fulfill regulatory requirements. Primary focus was regulations concerning revegetation, wildlife protection, threatened and endangered species, riparian habitat protection and reclamation, cultural resources, and administrative requirements.

Conducted on-site inspections of coal mining and reclamation operations to determine compliance with SMCRA and mining and reclamation plans issuing citations as necessary, and documented site conditions and violations. Participated as a witness in hearings associated with enforcement actions.

Coordinated reviews with other agencies, including the Fish and Wildlife Service, Forest Service, and state Divisions of Wildlife Resources and State History. Participated in Section 7 consultation with the Fish and Wildlife Service and obtained clearances for threatened and endangered species and cultural resources. Worked closely with these agencies and mine operators to resolve conflicts.

1986-1991, Utah Department of Agriculture, 350 N. Redwood Rd., Salt Lake City, Utah 84116. Supervisor: Richard Wilson.

#### **Seed Analyst and Technician**

- Performed regulatory and service seed testing for viability, purity, and disease, requiring knowledge of seed identification, morphology, and physiology.
- Worked to develop and publish rules associated with seed testing. Presented and defended these rules in meetings of the Association of Official Seed Analysts (AOSA) and the Society of Registered Seed Technologists. Certified seed analyst with the AOSA.

1981-1982, Utah Division of Wildlife Resources, 1594 W. North Temple, Salt Lake City, Utah 84114. Supervisor: Bruce Giunta.

**Biological Aide**, Full time temporary (summers) position.

- Worked on a big game range inventory crew assessing vegetation cover, productivity, and range condition in a variety of big game habitats.

#### Education

1982-1988, Utah State University, Logan, Utah

- M.S., Range Ecology
- Thesis Title: *Nutrient and Water Interrelationships between Crested Wheatgrass and Two Shrub Species*
- 

1979-1982, Weber State College, Ogden, Utah

- B.S., Botany, chemistry minor
- Magna cum Laude, Phi Kappa Phi, outstanding botany graduate of 1982

1973-1974, Brigham Young University, Provo, Utah

- No degree conferred, mathematics major

1973 Graduate of Layton High School, Layton, Utah 84041

#### Continuing

Education  
(not a complete list)

March 2002 through about July 2003

Worked to develop and teach a course titled "SMCRA and the ESA: Implementing the 1996 Biological Opinion" which concerned consultation for endangered species under the Surface Mining, Control and Reclamation Act and the Endangered Species Act

July 1999, Office of Surface Mining, Laramie, Wyoming  
Statistical Sampling for Baseline, Bond Release and other  
Environmental Monitoring Studies

July 1999, Office of Surface Mining, Salt Lake City, Utah  
Effective Writing

March 1999, Office of Surface Mining, Denver, Colorado  
Introduction to GPS

August 1997 and 1999, Office of Surface Mining, Denver, Colorado  
Wetlands Awareness course instructor

July 1997, Teton Science School, Kelly, Wyoming  
Wetlands Delineation Training and Wetlands Regulations, Permitting and  
Mitigation Planning

April 1996, Office of Surface Mining, Leesburg, Virginia  
Instructor Training

**Professional  
Organizations**

Member of the Utah Weed Control Association

**Other Interests**

Scouting, member of a Community Emergency Response Team (CERT),  
backpacking, gardening, running.

**Leslie Heppler**  
9899 South 2270 East  
Sandy, UT 84092  
Home Phone (801) 944-9404  
Business Phone (801) 965-4318

## **EXPERIENCE**

**Reclamation Specialist** –March 2008 to Present

**DEPARTMENT OF NATURAL RESOURCES – DIVISION OF OIL, GAS & MINING**, 1594 W. North Temple, Suite 1210, Salt Lake City, UT 84114

Responsibilities include:

- County Lead for nine Utah counties, including Daggett, Davis, Duchesne, Morgan, Salt Lake, Summit, Tooele, Uintah, and Wasatch Counties, of which include many complex and environmentally sensitive Mines.
- Lead tasks include review of reports and applications, writing letters requesting clarification of information, review plans, writing technical documents, and independent Cost Estimates.
- Perform site mine inspections, task include photo documentation and written summary of observations.
- Work with stake holders to address their concerns and gather their input as plans are developed, interaction includes other State of Utah Agencies, private Consultants, Contractors and involvement with public information meetings

Computer literate – input, access and utilize software including office software Corel and Microsoft word processing, spreadsheet, database and presentation software.

Supervisor: Paul Baker

**Project Geologist** –April 1995 to March 2008

**UTAH DEPARTMENT OF TRANSPORTATION - GEOTECHNICAL DIVISION**, 4501 South 2700 West, Salt Lake City, UT 84119

Responsibilities include:

- Maintain state wide inclinometer instrumentation data base; consisting of field acquisition of data, repair, calibration, maintenance, computer reduction, modeling of data, review and analyze monitoring data to ascertain trends
- Respond to emergencies involving stability problems
- Site investigations and written summary of observations of landslides, slope instability problems, settlement problems, geologic hazards and natural hazards
- Work with stake holders to address their concerns and gather their input as plans are developed, interaction includes other Department of Transportation Divisions, State of Utah Departments, private Consultants, Contractors and involvement with public information meetings
- Project Geotechnical Manager of many complex and environmentally sensitive geotechnical projects, including Hurricane Bridge replacement, Provo Canyon Tunnel remediation, and Legacy Parkway; Project Manager tasks include review of reports and applications, writing letters requesting clarification of information, review plans, writing technical documents for contracts and agreements such as Scope of Work, Requests for Qualifications, Requests for Proposal, Independent Cost Estimates
- Project Geotechnical Designer for US-6 safety improvements, SR-191 Moab Canyon and SR-20 rebuild; responsibilities include, drilling, testing and design, write construction specifications and prepare construction plans sheets
- Assist construction forces with technical assistance including geologic interpretations, construction alternatives, constructability issues, ensure compliance with contract terms
- Designed and implemented a new Safety Training Program and Safety Incentive Program for the Materials and Geotechnical Divisions



- Secured funding for the creation of UDOT Research state wide GIS Rockfall database and baseline study; Member the of TAC (Technical Advisory Committee) for both the Rockfall and Landslide Research Projects
- Involved with writing, reviewing, editing and updating the Geotechnical Manual of Instruction for the policy and procedures of the Geotechnical Division
- Implemented innovative stabilization techniques including Biotechnical stabilization in Parleys Canyon on I-80
- Presentations at NWGW in 1998 (Park City UT) and 2000 (Seattle WA)
- Active in the departments Total Quality Management program including QI Leader, PDQI Leader, and on the TEIC Executive Committee regarding policies and procedures

Computer literate – input, access and utilize software including office software Corel and Microsoft word processing, spreadsheet, database and presentation software - technical software includes Microstation (computer assisted technical drafting), Rock Works 99, Rockpack III, Xstable, CRSP 4.0, Digipro, Accutalk, and Logplt  
Supervisor: Keith Brown

#### **Drill and Blast Foreman--March 1994 to April 1995**

**BARNEYS CANYON MINE**, PO Box 311, Bingham, UT 84006

Responsibilities included:

- The safety and increased productivity of the drill and blast department (3 drill rigs with 12 drillers, 3 shifts per day - was able to decrease manpower by 3 persons and doubled production by increased efficiencies)
- Specify and maintain drilling and blasting supplies
- Oversee contract blasting - 5 person blasting crew - blasted an average of 55,000 Tons per day
- Determine acceptable blasting parameters (changed blasting parameters to save \$225,000 per year with increased fragmentation)
- Oversee sampling programs and ore control technicians (2 person crew).

Supervisor: Dan Benjamin

#### **Mine Supervisor--March 1993 to March 1994**

**BARNEYS CANYON MINE**, PO Box 311, Bingham, UT 84006

Responsibilities included:

- The safety and productivity of an 18 man mine crew (3 - 988 loaders, 10 - 777 trucks, 3 - D9 dozers, 2 - 14G graders)
- The hauling of ore and waste rock
- The maintenance of haul roads and dumps.

The crew under my direction consistently out performed the other crews in the areas of productivity and safety. Crew was number 1 in Safety and Production.

Supervisor: Dan Benjamin

#### **Geologist--November 1990 to March 1993**

**BARNEYS CANYON MINE**, PO Box 311, Bingham, UT 84006

Responsibilities included:

- Supervise ongoing project definition drilling of Barneys Canyon, Melco, North BC South, South BC South deposits - up to 5 drill rigs with 7 crews on steep terrain at one time
- Conduct sampling programs
- Oversee exploration reclamation - 26 acres reclaimed
- Determine geologic controls of the BC South area and incorporate geologic and assay data into a geological model suitable for mine planning
- Oversee drilling, pumping and pipeline activities of pit dewatering of the Barneys Canyon Pit.

Supervisor: William Gunter



**Geologist--October 1984 to November 1990**

**KENNECOTT EXPLORATION COMPANY**, 1515 Mineral Square, Salt Lake City, UT 80401

Duties and responsibilities included:

- Supervision of drill rigs - contract negotiation, obtain clearances, permits, agreements with from pertinent authorities, contract committee submissions, bid evaluation, scheduling and logistics, coordination between geologist and drilling companies
- Generate exploration targets - conduct regional and detailed sampling and mapping programs
- Follow-up anomalies - logging of rotary cuttings, generation of cross sections, drill target selection, design and supervision of road building, geotechnical and geologic logging of drill core, compilation and map generation
- Oversee exploration reclamation
- Assist with general exploration activities - trenching, drafting, and presentation graphics (construct information displays)

Supervisor: Jay Hammitt

**Geologist--May 1984 to September 1984**

**MAPCO MINERALS CORPORATION**, 1667 Cole Blvd., Suite 150, Golden, CO 80401

Involved in reconnaissance mapping and geochemical sampling with four prospects generated. Also performed detailed (1"=50' and 1"=100') mapping, program research, data compilation, VLF EM-16 and land acquisition.

Supervisor: Dave Snyder

**Geologist--November 1980 to December 1983**

**AMOCO MINERALS COMPANY**, 7200 South Alton Way, Englewood, CO 80155

Responsibilities included:

- Work on a Tertiary gold drilling program, Copperstone, AZ. Field work included diamond core logging, rotary drill hole preparation and logging, and determination of final down hole depth. Office work included compiling data, producing contour and isopach maps, ore reserve calculations
- Crew chief for a Precambrian Cu-Zn-Au volcanogenic massive sulfide reconnaissance program. Responsibilities included program research, target location, reconnaissance (1"=2000') and detailed (1"=500') mapping, geochemical sampling, data synthesis, and project budget accounting
- Program research, reconnaissance mapping, geochemical sampling and data compilation for a porphyry copper program in Arizona
- Data compilation for a cobalt program associated with Precambrian belt stratigraphy in eastern Idaho and western Montana

Supervisor: Graham Kelsey

**Geologist--May 1980 to November 1980**

**HOMESTAKE MINING COMPANY**, 108 West Tomichi, Gunnison, Colorado 81230

Involved in reconnaissance mapping, geochemical sampling, logging lithology and electrical logs and radiometric data collection in several hard-rock uranium projects. Duties also included surveying with a theodolite, research, land status evaluation/acquisition and building of roads and fences.

Supervisor: Rich Histed

**Geologic Technician--October 1979 to December 1979**

**HOMESTAKE MINING COMPANY**, 108 West Tomichi, Gunnison, Colorado 81230

Worked part-time during school mounting cuttings from radioactive rotary drill projects.

Supervisor: Charlie Matteson

**Assistant Geologist--June 1979 to September 1979**

**HOMESTAKE MINING COMPANY**, 7536 West 5th Avenue, Lakewood, Colorado 80215

Duties included property mapping, radiometrics (radiation data collection), VLF EM-16, geochemical sampling, research, drafting and land status evaluation in a hard rock uranium project.

Supervisor: Elliot Crist

**Hydrogeologist--June 1978 to September 1978**

**WM. CURTIS WELLS & COMPANY**, 60 Garden Office Center, Broomfield, Colorado 80020

Responsibilities included drilling, research, drafting, pumping test and other aspects associated with municipal drinking water wells.

Supervisor: Curt Wells

**AWARDS**

- Fast Track Award - 1999 Utah Department of Transportation
- NQI Bronze Award for US-6 Slide repair; November 2000; Dallas, Texas
- Excellence Award for Transportation Design - Virgin River Bridge 2001
- Engineering Excellence Award in Preconstruction Design - Moab to I-70 at Crescent Jct. Moab Canyon 2003
- Engineering Excellence Award in Project Management - SR-20 Reconstruction 2003
- 2004 UDOT Engineering Challenge Award for Virgin River Arch Bridge - Micropiles
- 2005 UDOT Engineering Challenge Award Provo Canyon Slide
- 2005 UDOT Engineering Challenge Award US-128 Rock Overhang

**EDUCATION**

B.A. Geology, Western State College of Colorado, Gunnison, Colorado. Graduated May 1980

**SUPPLEMENTAL INFORMATION**

Licensed Professional Geologist in State of Wyoming (PG-2918) and the State of Utah (5234258-2250). Employment opportunities have given me field experience in all types of geologic terrain, from the Precambrian to recent Quaternary soils. Areas of field experience include the western United States. Have traveled to all areas of the State of Utah. Use and understand principals and theories of the scientific process to interpret data, facts, and reason to draw proper scientific conclusions. Works well as a team member with minimum supervision and is self-motivated. Working conditions vary greatly from harsh natural environments (inclement weather and rough terrain) to office conditions, 25 years experience operating a 4X4 vehicle off road, and common overnight travel. Lift heavy downhole survey equipment (up to 50 lbs).

**PERSONAL DATA**

Single; U.S. citizen; valid Utah driver's license; born January 29, 1957; 5'4", 140 pounds; excellent health - no physical limitations.